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Manpower Development and Training Act (MDTA) programs completed in 1965 were evaluated by benefit-cost ratio and internal rate of return. Initial annual earnings differential figures at $525.650 and $719.629 were projected into the future at various rates of promotion and various rates of discount on the benefit stream. Resulting lifetime benefits (for 30 working years) range from $2.556.110 at a zero promotion rate and 20 percent discount rate on the first figure to $15.162.977 at a 3.5 promotion rate and a 5 percent discount rate for the $719.629 figure. These projected benefits may be compared with the total program cost of $3.097.616. On the other hand, the internal rates of return on the training outlay of $3.097.616 range from 16.29 percent at zero rate of promotion for the $525.650 figure to 26.20 percent at the 3.5 rate of promotion for the $719.629 figure. An alternative for the cost outlay would have to exceed the rate of return if the training were to be considered economically unprofitable. It was concluded that, under the circumstances and assumptions of the study, training conducted under MDTA is worthwhile with benefits greatly exceeding costs and internal rates of return high. Assessments of individual programs are also provided. (JK)

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PRELIMINARY REPORT.

A BENEFIT COST ANALYSIS OF THE SOUTH CAROLINA MDTA PROGRAM.

Prepared for and with the Cooperation
Of the Research Department
South Carolina State Employment Security Commission
Columbia, South Carolina

By

The Bureau of Business and Economic Research
College of Business Administration
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VT008573

PREFACE

The research reported herein was performed pursuant to a $5,000 grant from the South Carolina Employment Security Commission. Points of view or opinions stated do not necessarily represent official South Carolina Employment Security Commission position or policy.

In obtaining and tabulating data for a project of this nature, the cooperation of numerous people is necessary. The following were particularly helpful: James F. Kane, Dean, College of Business Administration, Charles E. Edwards, Director, Bureau of Business and Economic Research, College of Business Administration; Bryan Richey, Chief of Research and Statistics, William Powell, Junior Labor Market Analyst, Mrs. Pinckney Holmes, Senior Labor Market Analyst, Mary Baldwin, Administrative Assistant MDTA, Paul Jarvis, Chief of Manpower Training, all with the South Carolina Employment Security Commission.

James W. Robinson, Associate Professor of Business Administration, Virginia Polytechnic Institute, provided an excellent analysis of individual benefits resulting from the MDTA program under study. Although his analysis does not appear in this report, it has been given to the South Carolina Employment Security Commission. If this study is expanded, his analysis will appear in the later report.

Wendell Smith and Pierce Liles, graduate students at the University of South Carolina, contributed significantly to this study. Their tireless efforts in the frustrating task of compiling various comprehensive tables from sometimes non-comparable data are appreciated. Paul DeQuae did an excellent job with the computer programming. All of the typing was done most efficiently by Flora Lee Kees.

Any errors found herein are, of course, attributable only to the project director.

B. F. Kiker
Project Director

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I. THEORETICAL MODEL

Investment in area MDTA training is considered an important factor affecting labor productivity and, hence, wages and employment. The increase in relative earnings affects saving, investment, and thereby the growth of the region. Through training an individual can increase his productivity, reduce the probability of his being unemployed by increasing his adjustability to changing job opportunities, and, hence, increase his lifetime earnings.

In order to investigate the significance of MDTA training to the structure of relative earnings and economic growth, it is necessary to analyze expenditures on training as a process of capital formation. The process and its results can then be compared with other types of investment in order to develop a better understanding of the special contribution of training to economic growth.

We have chosen to treat all expenditures on MDTA training as investment. Although a portion of these expenditures may have been responsible for current consumption by the trainees, this portion would have been small.

Our criteria for evaluating the program are (1) benefit-cost ratio and (2) internal rate of return. The former criterion consists of estimating and comparing the benefits and the cost of the training program. The latter criterion consists of estimating the rate of discount (internal rate of return) that equates the benefit stream, that results

from the training, to the cost of the training program and comparing it with the opportunity cost of the investment funds (that is, the highest rate of return on investment opportunities sacrificed). Although there are conceptual difficulties associated with both criteria, each appears to be "correct" in evaluating a "sponsoring agency" program.

The essence of these kinds of analyses lies in their ability to evaluate the total value of benefits of a program against the total costs. Basic elements in these analyses are benefits, costs, time, and the interest rate by which to discount the benefits and costs. The benefits and costs of training usually occur through time--although in the case of the projects under study all costs were incurred in one time period.

A major concern of our analysis is with the determination of benefits (in the sense of social welfare gained) and costs (in the sense of social welfare foregone). Not only must these benefits and costs be identified but they must be measured in monetary terms. Neither of these are easy tasks. Although we are equating benefits to earnings differentials attributable to training, there is evidence that training results in reductions in public assistance and other social services (e.g. crime prevention); training generates tax revenues, provides skills for smooth transitions resulting from structural changes in the labor market, transmits existing knowledge, thereby laying the foundation for the extension of knowledge. Training also provides individual "psychic" as well as social benefits which, of course, cannot be quanti-

fied. (In all of the MDTA training courses under study basic education was offered. Such instruction included topics under elementary arithmetic, personal hygiene, language arts, etc. In view of this, a considerable portion of benefits may not be calculable. In other words, training for a given competence was only part of total training.)

On the other hand, benefits from training depend upon the supply and demand for the trainee's skill. Unless there is a demand for the knowledge or skill acquired by the trainee, his earnings differential stream may be zero. The greater the demand for his skill relative to the supply, the larger will be the earnings differential stream. Moreover, benefits defined as earnings differentials will be overstated if trainees displace other (presumably, untrained) workers. A reasonable assumption for South Carolina, however, is that no displacement occurred. The demand for the skills of those trained under MDTA in South Carolina greatly exceeded the supply.

Costs include outlays for items such as: instructors' salaries, supplies, heat, light, rental values of building and equipment, incidental costs to the trainees associated with training, and earnings foregone while in training--if appropriate.

Albeit the cost of training is incurred in the present, the benefits accrue over time, and since individuals have positive time preferences--that is, future income is valued less than present income--discounting obviously is necessary. Moreover, the interest rate used in discounting represents the opportunity cost of investment funds. It may

also represent in part a risk factor. Certainly risk and uncertainty reduce the value of any stream of future benefits, and it is possible to account in part for this by employing a discount rate that includes a risk factor.

One of our approaches to assessing the area MDTA training program is to find the total benefit resulting from the training and relate it to the total cost of the training. The total benefit (B) is determined by discounting the annual benefits (b) at the appropriate interest rate (i). The formula for determining B is:

$$B = \frac{b_1}{(1+i)} + \frac{b_2}{(1+i)^2} + \cdots \frac{b_n}{(1+i)^n}$$

$$b_1 = b$$

where:

$$b_2 = bv \left[1-\frac{P(2)}{2}\right]$$

$$b_3 = bv^2 \left[1-\frac{P(3)}{2}\right] \left[1-P(2)\right]$$

$$\vdots$$

$$b_n = bv^{n-1} \left[1-\frac{P(n)}{2}\right] \left[1-P(n-1)\right] \cdots \left[1-P(2)\right]$$

and

b_t: Annual benefit measured at the end of the appropriate year t.

b: Annual benefit at the end of year one; therefore, the promotion rate and mortality factor are included, i.e., $b_1 = b$.

v: Annual rate of promotion (promotion is synonymous with an increase in productivity and, hence, real remunera-

tion).

P(t): Proportion of persons alive at the beginning of the year who die during the year. For example, P(2) = proportion of persons alive at beginning of year two who die during the year. Since individuals die throughout the year, we have assumed that on the average they will die in the middle of the year. Hence, we assume that half of the annual earnings of those who die will remain in the benefit stream during the year of death.

n: The age at which the trainee retires from the labor force.

The benefits (B) must be compared with the total cost of training (C) to determine the "profitability" of the training projects. If $B > C$ or $(B / C) > 1$, we may assume that the area MDTA program was "economically profitable." If, on the other hand, $B < C$ or $(B / C) < 1$, the program was "unprofitable." This may not mean, however, that the training was not worthwhile; it may mean that it was carried on inefficiently. Even if the training program was conducted efficiently and $B < C$, attendant uncalculable psychic and social benefits may yet justify the training.

Our other approach to evaluating the area MDTA program is to find that rate of discount (r) that will equate the annual benefit stream (b) back to the cost of the training program (C). This internal rate of return (r) can be determined from the formula:

$$C = \frac{b_1}{(1+r)} + \frac{b_2}{(1+r)^2} + \cdots + \frac{b_n}{(1+r)^n}$$

The program may be termed "profitable" if $r > i$, where i is the oppor-

tunity cost of investment funds.

In assessing the "economic profitability" of programs, these approaches usually give the same results. We have chosen to present both criteria so that the reader may compare the B/C ratio and/or internal rates of return which have been calculated for the program under study with other comparable B/C ratios and internal rates of return that have been estimated.

II. EMPIRICAL MODEL

Introduction

This study examines only institutional training projects completed in South Carolina during calendar year 1965, though some of these may have begun in the preceding year. No on-the-job training projects were ended in this state under MDTA in 1965. Although about 250 institutional training projects were in progress with about 5,000 trainees in 1965, only 119 training courses were actually completed. Of these, however, there were 28 different types of projects. In other words, this study is concerned with training for 28 different occupations. To each different type of project there corresponds a certain DOT (Dictionary of Occupational Titles) code. When more than one project falls under a particular DOT, it is because nearly identical training was offered in different cities or in the same city at different times.

Many individuals who were offered training during the period under study did not continue to completion. Of the 2,768 to whom an opportunity for MDTA training was tendered, only 2,538 became enrolled by remaining in attendance five days after instruction began. Among those enrolled, 239 trainees dropped out to secure employment and 514 left for unknown reasons. Hence, for the projects covered in this study, 1,785 individuals became MDTA graduates (Graduates II) (Table 1). For each of these persons, the South Carolina Employment Security Commission (SCESC) completed several forms in order to derive statistical data. If one or

more of these forms on a given graduate were unavailable, then that graduate was excluded from this study. Deducting 73 such individuals, there remain 1,712 graduates (Graduates I) on whom fairly complete statistical information was available (Tables 1 and 2).

One year after course completion, 1,089 of the 1,712 Graduates I were contacted. The remaining 623 could not be located by the local ES offices (Table 2). Apparently, the attempt to contact MDTA graduates was not a truly diligent undertaking; probably this is a manifestation of deficiencies in time and personnel rather than of negligence. The follow-up did, however, reveal that 813 had sought and obtained employment, 194 were unemployed, and 82 had withdrawn from the labor force (Table 2). Some 29 of the younger graduates had never been employed prior to training. For these individuals, obviously, no measure of pre-training earnings was available. Accordingly, there remained only 784 employed Graduates I for whom both pre-training and post-training earnings were known.

While we are aware that a comparison of post-training and pre-training earnings is not the best procedure for estimating wage differentials, a funds and time constraint probibited setting up a control group of nontrainees. Given adequate funding and a longer period of time within which to complete the study, we would have compared the trainees' experience with that of a control group of nontrainees. The control group would have been composed of persons who had been accepted for enrollment in the MDTA program but who, for various reasons, had not

enrolled.

It is interesting to note that during 1964 and 1965 those who enrolled in MDTA programs were 60 per cent Negro; 53 per cent of the male enrollees and 70 per cent of the female enrolees were Negro. Virtually all MDTA trainees were unemployed before commencement of training (an average of 19 weeks' unemployment before entering training, though 45 per cent had been unemployed less than five weeks). Yet, fewer than one per cent were receiving unemployment compensation or public assistance.

Benefits

Benefits in terms of enhanced earning power may be disclosed by finding wage differentials. This has been done for the 784 employed Graduates I. For this group average straight-time hourly earnings before training was $.93 (Table 3, Column 2). Precisely one year after training was completed, the comparable amount was $1.26 (Table 3, Column 3), an hourly wage differential of $.33 (Table 3, Column 4). Though both the pre-training and post-training figures appear meager, the latter represents a 36 per cent improvement.

It is, perhaps, more useful to view wages from the perspective of the work week. Average individual pre-training wages based on a 40-hour work week were approximately $37 (Table 3, Column 7), whereas after training the comparable figure was $50 (Table 3, Column 8). Assuming a 50-week work year, average individual post-training earnings were $2,528 (Table 3,

Column 10). The comparable figure prior to training would have been $1,857 (Table 3, Column 9). The difference, about $670 annually, is multiplied by the employed Graduates I (784) estimate to obtain a total (or aggregate) earnings differential of $525,650, which is assumed to be attributable to the MDTA training (Table 4, Column 2).

Obviously all of the employed Graduates I were not employed throughout the entire year. In fact, they were employed an average of 83.5 per cent of the 52 weeks following the end of training. Accordingly, it might be desirable to reduce the $525,650 estimate of the annual benefit to $438,813 (Table 4, Column 6). (This methodology, of course, assumes that the wages of each employed trainee remained precisely the same throughout the year.) It is apparent that the total benefit to all graduates could scarcely be less than $438,813 during the first year following the training. As shall be posited below, a more realistic estimate of benefits would be much higher.

It is reasonable to assume that 784 graduates would be employed at all times in the first 50-week year, though not necessarily the same ones. In effect, we would have a revolving pool in which as one person left, another took his place. More precisely, this means that for each of the 784 who was unemployed at some time during the first year there corresponds one other graduate of the unemployed group who was employed (at the same wage) during the former's unemployment. Any graduates who worked some but who are not included above are assumed not to have worked at all. Again, a constant wage during the year is postulated. Given

these assumptions, the benefits issuing from training would be the first estimate given above, $525,650. This is, of course, a considerable sum. Again, however, benefits may be understated.

More than 600 of the graduates could not be located. Also, there were 73 additional graduates included in Graduates II. We have assumed, perhaps unrealistically, that the employment experience of these persons (for whom we have no record of success or failure in the labor market) was similar to that of those Graduates I who could be located. About 75 per cent of Graduates I who could be located were found employed (Table 5, Column 2). Hence, it can be concluded that about 75 per cent of those who could not be located and of the additional Graduates II were employed. Thus about 458 and 54 more graduates were probably employed, respectively, in the two categories mentioned above.

A further assumption is that the wage experience of these individuals was similar to our initial group of 784. In other words, hourly wages increased about $.33. Multiplying the hourly wage differential by the number of those "probably" employed, and, again, by 40 hours and 50 weeks, we have additional benefits of $336,386 (Table 5, Column 7). Adding $525,650 and the new amount, the resulting figure is $862,037 (Table 4, Column 3). However, the group of 754 were employed only 83 per cent of the time (Table 4, Column 4). In view of this, the benefit figure has been reduced correspondingly to $719,629 (Table 4, Column 5). This assumes that graduates who were not contacted had the same employment and wage experience as the 754 who were employed. Of course, the benefits to

the 29 who had no pre-training employment experience were ignored. Benefits are understated further to the degree that training (both general and specific) assists trainees who did not graduate.

Although three different representations of annual benefits accruing to trainees have been presented, the estimate of $438,813 is unrealistically low. Hence, it should not be considered further. Each of the other two estimates is confined to and couched within certain assumptions. The reader must determine for himself those assumptions he deems most realistic. He may then intelligently appraise the value of the two estimates.

Since the benefits of training obviously accrue over time, it is necessary to view benefits from the vantage point of the long run. The average age of the group of 784 was 35 years when training began (Table 3, Column 1). If they were to retire at age 65, there would remain 30 working years in their lifetime. Hence, it is necessary to estimate the benefits for graduates over the remainder of their working lives. It is inappropriate simply to multiply the annual earnings differential by the number of remaining working years. In projecting an earnings stream into the future, it is necessary to capture an approximate rate of increase in worker productivity. Accordingly, various rates of promotion were assumed. The SCESC contrived one of these (3.5 per cent) by employing a least squares equation on a statistical series for the years 1949 through 1967. The equation, used to anticipate probable earnings changes of graduates over time, reflected relative variations in earn-

ings of the South Carolina labor force participants. Thus, state average hourly earnings in covered employment became inputs in the construction of the equation. Any other measure of income would not have been directly compatible with the desired earnings increases per trainee. Although this rate is included in Tables 6 and 7, it is unrealistically high since it reflects an inflationary and industry-structure change which may not be repeated in the future. It is assumed that one of the rates given in Tables 6 and 7 will reflect properly the rate of promotion of both graduates and non-graduates since we have no empirical basis for suggesting that MDTA graduates will advance more rapidly than their untrained cohorts. The foregoing assumption is implicit in the fact that benefits were computed over time as the difference between pre and post-training income (one rate of promotion could have been assigned to pre-training earnings, another one to post-training earnings). To each of the two aggregate benefit figures the stated rate of promotion over 30 years was applied.

We cannot merely sum the yearly benefits including promotions. Costs were incurred in the present; benefits did not occur similarly or simultaneously. Hence, for compatibility, it becomes necessary to place benefits in present-value terms. In addition, some of the graduates will die during the ensuing 30 years. To account for mortality, the benefit stream was diminished annually by an amount commensurate with the death rate for South Carolinians at each age level up to 65. Persons who die were assumed to have died in the middle of each year.

Perhaps at this juncture an example of the procedure for calculating the benefit stream would be helpful. The theoretical model presented above may be written as

$$B = \frac{b}{(1+i)} + \frac{bv\left[1-\frac{P(2)}{2}\right]}{(1+i)^2} + \frac{bv^2\left[1-\frac{P(3)}{2}\right]\left[1-P(2)\right]}{(1+i)^3} + \cdots$$

$$+ \frac{bv^{n-1}\left[1-\frac{P(n)}{2}\right]\left[1-P(n-1)\right]\cdots\left[1-P(2)\right]}{(1+i)^n}$$

where the variables are the same as defined above. B may be replaced by C and i replaced by r, to find r, the internal rate of return. Each numerator on the right hand side of the equation corresponds to b_1, b_2, b_3, ... b_n in the earlier benefit formula.

Assume that one year after completion of training the total earnings differential of all 28 MDTA training projects was $525,650, our low estimate. We found that the average age of the trainees one year after completion of training was 36 years. Further, the rate of promotion is assumed to be 3.5 per cent. Hence, the benefit stream is:

$b_1 = \$525,650$

$b_2 = \$525,650 \quad (1.035)\left[1-\frac{.00335}{2}\right] = \$543,136.46$

$b_3 = \$525,650 \quad (1.035)^2\left[1-\frac{.00360}{2}\right](1-.00335) = \$560,192.88$

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$$b_{30} = \$525,650 \quad (1.035) \left[1-\frac{.02978}{2}\right] \quad (1-.02771) \quad \ldots$$

$$(1-.00335) \quad = \quad \$985,486.26$$

where .00335 = the proportion of persons alive at the beginning of year aged 36 and who die between the ages of 36 and 37.

.00360 = proportion of persons alive at age 37 who die between the ages of 37 and 38.

In essence,

b_1 = \$525,650.00 = earnings at age 36

b_2 = \$543,136.46 = earnings at age 37

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b_{30} = \$985,486.26 = earnings at age 65.

These earnings have not been discounted and, of course, cannot be summed to obtain the total economic benefits attributable to the 1965 area MDTA training.

As was pointed out earlier, a major difficulty in calculating a benefit-cost ratio is selecting the appropriate interest rate. We have discounted the benefit stream at four rates of interest, five, ten, fifteen, and twenty per cent. The low rate was chosen because it represents roughly the cost of acquiring federal funds. The higher rate was selected to account for the fact that we are more concerned with more immediate benefits than very long-run ones. The most realistic rate is either 10 or 15 per cent. Obviously, the higher the discount rate, the more the emphasis is put on more immediate benefits relative to distant

ones.

Costs

The Department of Health, Education and Welfare and the Department of Labor, which during the period of this study financed MDTA in South Carolina, required that the SCESC office estimate and itemize all costs associated with proposed training programs under MDTA. These estimates are itemized on standard forms (MT-2 and OE-4000). These forms for approved training projects are the bases of our cost estimates. However, where actual costs differed from estimated costs, the latter were made available by SCESC and used. The costs of all the MDTA projects have been aggregated on a DOT code basis. This was done because our analysis is predicated upon an examination of costs and benefits by different types of projects rather than by individual projects (when more than one project falls under a particular DOT, it is because almost identical training was offered in different areas in the state or in the same area at different times). Many of the cost items were itemized in a useful context and required mere summing by DOT. Other items, however, were difficult to estimate and had to be imputed. The procedures for estimation and imputation are presented below.

The total training costs (including allowances) are summarized in the following categories:

(1) Allowances (C_e = \$1,566,621)--weekly payment to the trainees over the entire training period.

(2) Executive administration cost (C_{ea} = \$47,005)--earnings of SCESC personnel engaged in planning, coordinating, and keeping statistics on the MDTA projects.

(3) Allowance administration (C_{aa} = \$62,108)--the cost of administering the allowance program.

(4) Selection and placement administrative cost (C_{spa} = \$143,520)--the expense of selecting trainees and placing them after completion of training programs.

(5) Instructional supplies (C_{is} = \$230,887)--this category includes the cost of items such as notebooks, pencils, rags, brooms, junk automobile parts, various types of lumber, etc. Obviously, items in this category would vary with the nature of the training. No item included in this category was thought to last more than one project.

(6) Instructional services (C_{iser} = \$651,888)--cost in this category includes remuneration for instruction and local supervision.

(7) Fixed charges (C_{fc} = \$87,062)--this category includes rental charges for non-public space plus the employer share of employee (non-trainees assisting in the training projects) benefits.

(8) Utilities, custodial, and maintenance (C_{ucm} = \$82,502)--charges for telephone, electricity, water, minor repairs, janitorial service, etc. are included in this category.

(9) Rental opportunity cost (C_{ro} = \$31,878)--a charge was imputed to each project conducted in public space.

(10) Equipment and repairs (C_{er} = \$194,145)--this category includes costs for transportation, installation, and repair of equipment, in addition to an estimate of the cost of any equipment used in the project. Also, rental of equipment (such as farm machinery) is included in this category.

All of these costs are enumerated by training project and aggregated in Table 8.

The categories given above are essentially those used by SCESC or

were easily derived therefrom. Owing to the difficulty of treating numerous categories, we further subsummed these cost items in the categories of administration (C_a), allowances (C_e), instruction (C_i), and plant and equipment (C_p). Total costs (C), of course, would be the sum of these four items. In essence:

C	=	C_e	+	C_a	+	C_i	+	C_p
$3,097,616	=	$1,530,995	+	$252,633	+	$882,775	+	$395,587

where

C_e	=	C_e
$1,566,621	=	$1,566,621

C_a	=	C_{ea}	+	C_{aa}	+	C_{spa}
$ 252,633	=	$ 47,005	+	$ 62,108	+	$143,520

C_i	=	C_{is}	+	C_{iser}
$ 882,775	=	$ 230,887	+	$651,888

C_p	=	C_{fc}	+	C_{ucm}	+	C_{ro}	+	C_{er}
$ 395,587	=	$ 87,062	+	$ 82,502	+	$ 31,878	+	$194,145

The condensed categories of costs are presented in Table 9.

Most of the cost items are enumerated by SCESC in a useful manner. The following cost items, however, provided some estimation and/or imputation difficulties: rental opportunity (C_{ro}), equipment and repairs (C_{er}) and administration (C_a).

Rental Opportunity Cost

For many of the training projects, space was available in public facilities in the state. In this event there was no rental figure in the cost profile. Presumably, however, there is an opportunity cost associated with using these facilities. To account for this cost an amount for rent was imputed to each project conducted in public space. If, under a DOT code, any of the projects were performed in public space, the average rental for other training courses under the same DOT code in which rental data were available (that is, when training was done in non-public space) was imputed to the projects. When cost data were unavailable under the same DOT code, rental cost (appropriately adjusted for possible varying lengths of training courses) of a project requiring what we deemed to be similar facilities was imputed to the projects for which rental data were unavailable.

Equipment

Costs for repairs and transportation of equipment (much equipment was transferred from center to center) were well-defined in SCESC records. For many of the programs, however, equipment costs were not distinct and had to be estimated. There were obvious reasons for this: (1) equipment may have been purchased previously for use in MDTA projects; (2) the state may have acquired the equipment under programs other than MDTA; (3) the entire purchase price was included in the 1965 cost profile if required equipment was unavailable at the time of

appropriation request.

Since there is a cost even if equipment was available, it was necessary to devise a procedure for estimating a portion of the institutional price of each piece of equipment utilized (whether newly purchased or transferred). An estimate of the useful life span of each piece of equipment was made by an appropriate state employee. The longevity estimates of the equipment used spanned one to fifteen years, the length depending upon the durability of the item. We, of course, assumed reasonable care and maintenance. Our calculation of the equipment costs proceeded in the following manner.

The length of time in weeks (T_p) that each project lasted was divided into total time (T_t = 52 weeks). In a given project, this number was multiplied by the anticipated life of each piece of equipment (L). To obtain that portion of the total cost (C_{er}) of a piece of equipment to impute to a particular project, the figure last obtained was divided into the item's price (E_p). That is,

$$C_{er} = \frac{E_p}{\frac{T_t}{T_p} \times L}.$$

Employing this technique, we have insured a more substantial equipment valuation for the lengthier project.

Our final modification in our equipment estimates was required. Some of the equipment was not in use perpetually, as the foregoing methodology assumes. Much of the equipment, if not in use under MDTA,

was in use in technical education centers throughout the state. However, an appropriate source indicated that about 15 per cent of the equipment, in money terms, was in storage or transit continuously, though not the same equipment week after week. As a correction of this, 15 per cent was added to the adjusted cost of equipment for each DOT code.

Administration Costs

Costs were incurred by the local SCESC office for planning, allowance administration, placement, and other administration. Administration costs on the project level are included under instructional services.

During the fiscal year 1965, the services of 9.4 individuals were required in planning, coordinating, and keeping statistics on the MDTA programs. Since the salaries of these employees were given for the fiscal year 1965, an adjustment upward was made to account for promotions and salary increases which were incurred during the ensuing six months of the calendar year under study. The earnings of the group has been termed executive administration cost, the sum of which was apportioned equally among the projects. Obviously, the amount apportioned per DOT code depended upon the number of projects under the particular DOT code.

An expense to any large employer is that surrounding the issuance of checks. A great deal of money was expended for allowances to the trainees during their training. In addition to the actual amounts of

the payment, a legitimate cost consideration is the cost of administering the allowance program. In many of the project cost profiles an amount was provided to cover this expense. For each project for which allowance administration cost was listed, the average (per prospective trainee) allowance administration cost was divided by the number of weeks which the project lasted. This gave the average weekly allowance administration cost. This cost ranged from approximately $1.04 to $1.44; the average was $1.1466. For some DOT codes no average allowance administration cost was given for any of its projects. In these cases, an estimate of $1.1466 was used. If a particular DOT code had at least one average allowance administration cost listed for one of its projects, this figure was used to estimate average weekly allowance administration cost for all projects under the DOT code. If under one DOT code several averages were listed, then the modal one became the average weekly allowance administration cost estimate. Accordingly, for each unlisted average allowance administration cost an amount was imputed to each project by multiplying the number of weeks times the appropriate average weekly allowance administration cost. Allowance administration costs per prospective trainee averaged approximately $22.00 within the duration of each project; the most significant factor in deviation from this figure was project length.

Allowance administration cost was derived for each project by multiplying the number of prospective trainees times its particular average allowance administration cost. The total for all training

embraced in the study was obtained by summing, under each DOT code for all 119 projects.

Selection and placement, finally, are further cost items which were estimated. Some cost prospectuses contained average and total estimates of such costs. The range in the averages was from about $46.00 to $55.00, with no apparent correspondence between this cost and the number of weeks or number of trainees in the project. Hence, no systematic method could be applied to arrive at an average to impute to those projects for which a figure was not listed. Through ad hoc reasoning we obtained an estimate of $52.00, which when multiplied by the appropriate number of trainees, becomes a project's selection and placement administration cost.

III. CONCLUSION

By projecting the annual total benefit estimate (b) of $525,650 into the future at various rates of promotion, appropriately considering the probability of mortality, and discounting the benefit stream at various rates of interest, estimates of lifetime benefits (B) to society resulting from the 1965 MDTA training program under study are deduced and shown in Table 6. If, for example, the rate of promotion is 3.5 and the discount rate is 10 per cent, the benefit estimate is $6,332,203. These benefits can be usefully compared with the total cost of conducting the program, $3,097,616 (Table 9) to determine its "economic profitability."

The internal rates of return on the training outlay ($3,097,616), using the annual benefit estimate of $525,650, appropriately adjusted to account for promotion and mortality, are given in Table 10. If, for example, the rate of promotion is 3.5, the internal rate of return is 19.7. Hence, an alternative for the cost outlay would have to exceed 19.7 per cent before the training under study could be said to be "economically unprofitable." If the opportunity costs were five and ten per cent, the sponsoring agency could incur the costs $11,075,733 and $6,332,202, respectively, for training and still "break even."

Treating the annual total benefit estimate of $719,629 in the same manner in which the lower estimate was treated, estimates of lifetime benefit to society resulting from the training under study are calculat-

ed and given in Table 7. If the promotion rate is assumed to be 3.5 per cent and the discount rate is 10 per cent, the total benefit estimate is $8,668,956.

The internal rate of return calculated from the higher benefit stream ($719,629), assuming a promotion rate of 3.5 per cent and accounting for mortality, is 26.19 per cent (Table 11).

It is apparent that under the circumstances and assumptions of this study, training conducted by the SCESC under MDTA is worthwhile. Benefits greatly exceed costs and the internal rates of return estimated are exceedingly high.

Along with assessing area MDTA training completed in 1965 in the aggregate, we have evaluated each of the 28 projects individually. Of these projects the estimated benefits and costs of those with 17 or more graduates are given in Tables 12 through 33. These benefit-cost ratios indicate the "profitability" of individual training programs, e.g., nurses aide and carpenter. Moreover, we are able to deduce from the results the maximum average age ("break-even" age) at which trainees could have begun work and the social benefits still resulted in a benefit-cost ratio greater than unity. For example, we found that the benefit from training 182 individuals with an average age of 36 to be nurses aides was $753,712, assuming a "low" initial earnings differential (i.e., considering only those who were contacted and employed) and accounting for promotion (in this case assume zero rate of promotion), mortality, and time (discounting at 10 per cent). The cost of training these indi-

viduals was $333,841. Hence, the benefit-cost ratio is high and, given these assumptions, society could still have recouped all the cost of training if the average age of the trainees had been approximately 60 years. If, on the other hand, the average age of the trainees had been 21 years, given the assumptions above, the benefit from the training would have been $808,193 (Table 12). The same type information for the 341 nurses aide Graduates I, assuming a "high" initial earnings differential (i.e., considering all those who completed training), is given in Table 13.

The benefit from training 78 carpenters with an average age of 39 was $593,083, assuming an annual rate of promotion of 2.0 per cent, appropriately accounting for mortality, and discounting at 10 per cent. If the average age of these trainees had been 21 years, given the assumption above, the benefit from training would have been $681,313. The cost of training these individuals was $548,067. If we assume a 10 per cent discount rate and a zero rate of promotion for these carpenters, the "break-even" age is 28 years (Table 14). The same type information for the 187 carpenter Graduates I is given in Table 15.

It is strongly recommended that additional work on this project be pursued, for a number of reasons. The project should be expanded to include data for area training conducted under MDTA and completed in 1966. These data should be analyzed in the same manner as the 1965 data.

The benefit-cost ratios which we have determined are, of course, total-benefit - total-cost ratios, whether for all projects combined or for individual projects (training under a particular DOT code). As a

tool for decision making, however, it is necessary to calculate marginal (incremental)-benefit - marginal (incremental)-cost ratios. If it is found that a total-benefit - total-cost ratio is high (or higher than another comparable B/C ratio), one can say that the project under evaluation is "profitable." One cannot, however, say that more funds should be expended on the project with the high (higher) B/C ratio. In order to make policy decisions of this nature, it is necessary to utilize marginal (incremental) data. It will be necessary to determine the difference between 1966 and 1965 benefits (B) and costs (C). In essence, if

$$B_{1966} - B_{1965} = \Delta B$$

$$C_{1966} - C_{1965} = \Delta C$$

and ($\Delta B / \Delta C$) exceeds unity, more training funds could be profitably expended on area MDTA training.

Given adequate financing, we could determine marginal-benefit - marginal-cost ratios for all of the individual (DOT) training programs for which we have both 1965 and 1966 data. The maximization of social benefits resulting from the training is achieved if the ratio of marginal benefits of the individual training projects is equal to the ratio of the marginal costs of these projects, i.e.,

$$\left[\frac{\Delta B}{\Delta C}\right]_1 = \left[\frac{\Delta B}{\Delta C}\right]_2 = \cdots = \left[\frac{\Delta B}{\Delta C}\right]_n$$

where the subscript refers to the particular training project (DOT Code). If, for example,

$$\left[\frac{\Delta B}{\Delta C}\right]_1 > \left[\frac{\Delta B}{\Delta C}\right]_2,$$

then more individuals should be trained in the training project 1. This can be done by allocating more funds to MDTA training and expending them on project 1, or shifting funds from project 2 into project 1. It would be desirable to expand the study to include marginal analysis of this type.

Finally, with continuation of the project, an attempt could be made to evaluate the relationship between various characteristics of the trainees (age, sex, race, education) and earnings. Also, an evaluation of the relationships among training, earnings, occupations, and industry types could be made. Information on such relationships as the above would be valuable for more complete appraisal of training programs. Thus, expansion of this project to include further work and study is highly desirable and is strongly recommended.

TABLE 1

Training	Offered Training	Enrolled	Dropouts for Employment	Dropouts Other Reasons	Total Dropouts	Graduates I	Graduates II -Graduates I
Draftsman	13	13	3	5	8	5	0
Clerk	59	52	5	16	21	31	4
Duplicating Machine Operator	29	30[a]	2	8	10	20	6
Tabulating Machine Operator	24	20[b]	2	4	6	14	1
Stenographer	129	121	8	49	57	64	2
Salesperson	20	20	1	1	2	18	0
Chambermaid	126	120	1	11	12	108	5
Cook	78	76	7	19	26	50	0
Waiter-Waitress	51	47	4	3	7	40	0
Kitchen Helper	41	39	2	4	6	33	1
Nurse Aide	463	422[c]	9	64	73	349	8
Janitor	52	42	4	9	13	29	1
Farm Machine Operator	239	225[d]	11	18	29	196	5
Landscape Gardener	91	82	12	15	27	55	3
Furniture Upholsterer	50	40	4	1	5	35	1
Welder	43	39	5	16	21	18	0
Bricklayer	240	219[e]	40	57	97	122	4
Carpenter	397	343	53	89	142	201	14
Meat Cutter	25	19	1	6	7	12	0
Automobile Mechanic	121	112	20	29	49	63	2
Body Repairman	21	21	1	6	7	14	0
Sewing Machine Repairman	18	16	4	1	5	11	0
Air-conditioning Mechanic	21	21	5	4	9	12	1
Sewing Machine Operator	196	187[f]	3	25	28	159	2
Machine Tool Operator	124	123	23	33	56	67	2
Chassis Assembler	16	16	2	4	6	10	0
Presser	25	20	2	2	4	16	8
Service Station Attendant	56	53	5	15	20	33	3
	2768	2538[g]	239	514	753	1785	73

Graduates II = 73 additional graduates included herein who are not included in Graduates I. Complete information on the extra 73 was not available. Total graduates = Graduates II.

Enrolled = Still in training after 5 days.

Note: Where letters appear, figures did not add up, and an adjusted figure was inserted to correct this. The nonadjusted numbers are as follows: a = 28, b = 22, c = 425, d = 224, e = 223, f = 186, and g = 2543.

Source: South Carolina Employment Security Commission

TABLE 2

Training	Graduates I	Employed	Unemployed	NILF	CNL
Draftsman	5	3	0	1	1
Clerk	27	21	2	1	3
Duplicating Machine Operator	14	3	4	0	7
Tabulating Machine Operator	13	9	0	0	4
Stenographer	62	39	5	1	17
Salesperson	18	8	4	3	3
Chambermaid	103	33	18	12	40
Cook	50	26	8	2	14
Waiter-Waitress	40	9	5	2	24
Kitchen Helper	32	10	6	5	11
Nurse Aide	341	188	40	18	95
Janitor	28	11	3	0	14
Farm Machine Operator	191	91	9	7	84
Landscape Gardener	52	17	10	3	22
Furniture Upholsterer	34	11	4	0	19
Welder	18	10	1	0	7
Bricklayer	118	71	5	3	39
Carpenter	187	79	18	13	77
Meat Cutter	12	10	0	0	2
Automobile Mechanic	61	32	6	1	22
Body Repairman	14	3	3	0	8
Sewing Machine Repairman	11	9	0	1	1
Air-conditioning Mechanic	11	1	1	0	9
Sewing Machine Operator	157	68	33	4	52
Machine Tool Operator	65	31	5	4	25
Chassis Assembler	10	5	1	0	4
Presser	8	5	2	1	0
Service Station Attendant	30	10	1	0	19
	1712	813	194	82	623

Graduates I = graduates included in all tabulations; relatively complete data available.
Employed = Graduates I found employed one year following training.
Unemployed = Graduates I found unemployed one year following training.
NILF = Graduates I who were not in the labor force one year following training.
CNL = Graduates I who could not be located one year following training.

Source: South Carolina Employment Security Commission

TABLE 3

AGE AND EARNINGS: PRE-TRAINING, POST-TRAINING, DIFFERENTIAL BY HOUR, WEEK,

Training	1 Average Age[1]	2 Average Pre-training Earnings[2]	3 Average Post-training Earnings[3]	4 Average Difference[4]	5 Average Difference X 40[5]	6 Average Difference X 40 X 50[6]	7 Average Pre-trainin Earnings X
raftsman	27.00	1.7750	1.9500	.1750	7.0000	350.0000	71.0000
lerk	33.42	1.0958	1.4247	.3289	13.1560	657.8000	43.8320
uplicating Machine Operator	27.33	1.3166	1.9400	.6233	24.9320	1246.6000	52.6640
abulating Machine Operator	27.67	1.1766	1.5366	.3600	14.4000	720.0000	47.0640
tenographer	31.86	1.2125	1.3777	.1653	6.6120	330.6000	48.5000
alesperson	32.13	.8500	1.1700	.3200	12.8000	640.0000	34.0000
hambermaid	31.16	.6032	.8523	.2490	9.9600	498.0000	24.1280
ook	41.92	.8600	1.1319	.2719	10.8760	543.8000	34.4000
aiter-Waitress	33.22	.5889	.8666	.2777	11.1080	555.4000	23.5560
itchen Helper	30.10	.5300	1.0500	.5200	20.8000	1040.0000	21.2000
urse Aide	35.81	.7484	.9793	.2310	9.2400	462.0000	29.9360
anitor	40.45	.8955	1.1909	.2955	11.8200	591.0000	35.8200
arm Machinery Operator	43.37	.6419	.8211	.1792	7.1680	358.4000	25.6760
andscape Gardener	42.53	1.1694	1.2188	.0494	1.9760	98.8000	46.7760
urniture Upholsterer	37.45	1.0818	1.4772	.3954	15.8160	790.8000	43.2720
elder	33.50	1.7200	2.2640	.5440	21.7600	1088.0000	68.8000
ricklayer	31.91	1.1924	1.8791	.6867	27.4680	1373.4000	47.6960
arpenter	38.55	1.1806	1.5547	.3741	14.9640	748.2000	47.2240
eat Cutter	32.11	1.2666	1.6588	.3922	15.6880	784.4000	50.6640
utomobile Mechanic	31.84	1.0326	1.5761	.5435	21.7400	1087.0000	41.3040
ody Repairman	27.33	1.0833	.9166	-.1666	- 6.6640	- 333.2000	43.3320
ewing Machine Repairman	40.56	1.4900	1.7900	.3000	12.0000	600.0000	59.6000
ir-conditioning Mechanic	22.00	1.2500	1.7700	.5200	20.8000	1040.0000	50.0000
ewing Machine Operator	34.52	.7411	1.1818	.4407	17.6280	881.4000	29.6440
achine Tool Operator	30.32	1.1642	1.6932	.5290	21.1600	1058.0000	46.5680
hassis Assembler	32.00	.8500	1.4150	.5650	22.6000	1130.0000	34.0000
resser	33.60	.7140	1.1500	.4360	17.4400	872.0000	28.5600
ervice Station Attendant	33.40	1.2050	1.2950	.0900	3.6000	180.0000	48.2000
	35.76	.9287	1.2639	.3352	13.4080	670.4000	37.1480
				*	*	*	

* 36.09% increment

(1) One year after training
(2) (3) (4) hourly
(5) Increase in weekly earnings with training
(6) Increase in yearly earnings with training
(7) Weekly earnings prior to t
(8) Weekly earnings after tra
(9) Yearly earnings prior to t
(10) Yearly earnings after tra

ource: South Carolina Employment Security Commission

TABLE 3

-TRAINING, POST-TRAINING, DIFFERENTIAL BY HOUR, WEEK, AND YEAR

4 Average Difference[4]	5 Average Difference X 40[5]	6 Average Difference X 40 X 50[6]	7 Average Pre-training Earnings X 40[7]	8 Average Post-training Earnings X 40[8]	9 Average Pre-training Earnings X 40 X 50[9]	10 Average Port-training Earnings X 40 X 50[10]
.1750	7.0000	350.0000	71.0000	78.0000	3550.0000	3900.0000
.3289	13.1560	657.8000	43.8320	56.9880	2191.6000	2849.4000
.6233	24.9320	1246.6000	52.6640	77.6000	2633.2000	3880.0000
.3600	14.4000	720.0000	47.0640	61.4640	2353.2000	3073.2000
.1653	6.6120	330.6000	48.5000	55.1080	2425.0000	2755.4000
.3200	12.8000	640.0000	34.0000	46.8000	1700.0000	2340.0000
.2490	9.9600	498.0000	24.1280	34.0920	1206.4000	1704.6000
.2719	10.8760	543.8000	34.4000	45.2760	1720.0000	2263.8000
.2777	11.1080	555.4000	23.5560	34.6640	1177.8000	1733.2000
.5200	20.8000	1040.0000	21.2000	42.0000	1060.0000	2100.0000
.2310	9.2400	462.0000	29.9360	39.1720	1496.8000	1958.6000
.2955	11.8200	591.0000	35.8200	47.6360	1791.0000	2381.8000
.1792	7.1680	358.4000	25.6760	32.8440	1283.8000	1642.2000
.0494	1.9760	98.8000	46.7760	48.7520	2338.8000	2437.6000
.3954	15.8160	790.8000	43.2720	59.0880	2163.6000	2954.4000
.5440	21.7600	1088.0000	68.8000	90.5600	3440.0000	4528.0000
.6867	27.4680	1373.4000	47.6960	75.1640	2384.8000	3758.2000
.3741	14.9640	748.2000	47.2240	62.1880	2361.2000	3109.4000
.3922	15.6880	784.4000	50.6640	66.3520	2533.2000	3317.6000
.5435	21.7400	1087.0000	41.3040	63.0440	2065.2000	3152.2000
-.1666	- 6.6640	- 333.2000	43.3320	36.6640	2166.6000	1833.2000
.3000	12.0000	600.0000	59.6000	71.6000	2980.0000	3580.0000
.5200	20.8000	1040.0000	50.0000	70.8000	2500.0000	3540.0000
.4407	17.6280	881.4000	29.6440	47.2720	1482.2000	2363.6000
.5290	21.1600	1058.0000	46.5680	67.7280	2328.4000	3386.4000
.5650	22.6000	1130.0000	34.0000	56.6000	1700.0000	2830.0000
.4360	17.4400	872.0000	28.5600	46.0000	1428.0000	2300.0000
.0900	3.6000	180.0000	48.2000	51.8000	2410.0000	2590.0000
.3352	13.4080	670.4000	37.1480	50.3560	1857.4000	2527.8000

(7) Weekly earnings prior to training
(8) Weekly earnings after training
(9) Yearly earnings prior to training
(10) Yearly earnings after training

ge with training
ge with training

TABLE 4

Training	1 CNL + Other Benefits	2 Employed Benefits	3 CNL + Other + Employed Benefits	4 % of 52 Week Year Employed	5 Benefits	6 Minimum Benefits
Draftsman	262.40	700.00	962.40	.9615	925.35	673.05
Clerk	4028.80	12498.20	16527.00	.6959	11501.14	8697.50
Duplicating Machine Operator	6944.00	3739.80	10683.80	.6346	6779.94	2373.28
Tabulating Machine Operator	3600.00	4320.00	7920.00	.9038	7158.10	3904.42
Stenographer	5443.20	11901.60	17344.80	.7672	13306.93	9130.91
Salesperson	1023.80	5120.00	6143.80	.8509	5227.76	4356.61
Chambermaid	11738.20	15438.00	27176.20	.6904	18762.45	10658.40
Cook	5498.20	14138.80	19637.00	.7699	15118.53	10885.46
Waiter-Waitress	7497.80	4998.60	12496.40	.7000	8747.48	3499.02
Kitchen Helper	5941.40	10400.00	16341.40	.7442	12161.27	7739.68
Nurse Aide	36365.00	84084.00	120449.00	.9169	110439.69	77096.62
Janitor	6965.00	6501.00	13466.00	.6153	8285.63	4000.07
Farm Machinery Operator	27125.60	32614.40	59740.00	.8692	51916.01	28348.44
Landscape Gardener	1399.20	1679.60	3078.80	.7443	2291.55	1250.13
Furniture Upholsterer	11597.60	8698.80	20296.40	.7360	14938.15	6402.32
Welder	6922.80	10880.00	17802.80	.8173	14550.23	8892.22
Bricklayer	53073.60	96138.00	149211.60	.8787	131112.23	84476.46
Carpenter	48892.40	58359.60	107252.00	.8493	91089.12	49564.81
Meat Cutter	1568.80	7059.60	8628.40	.9288	8014.06	6556.9[illegible]
Automobile Mechanic	21405.00	33697.00	55102.00	.8611	47448.33	29016.49
Body Repairman	- 1332.80	- 999.60	- 2332.40	.9487	- 2212.75	- 948.32
Sewing Machine Repairman	540.00	5400.00	5940.00	.9444	5609.74	5099.76
Air-conditioning Mechanic	5200.00	1040.00	6240.00	.9807	6119.57	1019.93
Sewing Machine Operator	30822.60	53765.40	84588.00	.7536	63745.52	40517.61
Machine Tool Operator	22138.40	32798.00	54936.40	.9200	50541.49	30174.16
Chassis Assembler	3766.40	4520.00	8286.40	.5576	4620.50	2520.35
Presser	4360.00	4360.00	8720.00	.7884	6874.85	3437.42
Service Station Attendant	3599.40	1800.00	5399.40	.7908	4269.85	1423.44
	336386.80	525650.80	862037.60	.8348	719628.99	438813.29

CNL Benefits = Wage Difference times CNL Employed times 40 times 50
Other Benefits = Probably Employed times Wage Difference times 40 times 50
Employed Benefits = Wage Difference times 40 times 50 times the number of employed Graduates I for whom both pre-training and post-training earnings were available
% of 52 Week Year Employed = % of 52 weeks following graduation during which employed
Benefits = Column 3 times Column 4
Minimum Benefits = Column 2 times Column 4

Source: South Carolina Employment Security Commission

TABLE 5

Training	1 Graduates II -Graduates I	2 Probability of Employment	3 Probably Employed	4 Wage Difference	5 Other Benefits	6 CNL Benefits	7 CNL + Other Benefits
Draftsman	0	.7500		.1750		262.40	262.40
Clerk	4	.8750	3.5000	.3289	2302.20	1726.60	4028.80
Duplicating Machine Operator	6	.4285	2.5710	.6233	3205.00	3739.00	6944.00
Tabulating Machine Operator	1	1.0000	1.0000	.3600	720.00	2880.00	3600.00
Stenographer	2	.8666	1.7332	.1653	572.80	4870.40	5443.20
Salesperson	0	.5333		.3200		1023.80	1023.80
Chambermaid	5	.5238	2.6190	.2490	1304.20	10434.00	11738.20
Cook	0	.7222		.2719		5498.20	5498.20
Waiter-Waitress	0	.5625		.2777		7497.80	7497.80
Kitchen Helper	1	.4761	.4761	.5200	495.00	5446.40	5941.40
Nurse Aide	8	.7642	6.1136	.2310	2824.40	33540.60	36365.00
Janitor	1	.7857	.7857	.2955	464.20	6500.80	6965.00
Farm Machinery Operator	5	.8504	4.2520	.1792	1523.80	25601.80	27125.60
Landscape Gardener	3	.5666	1.6998	.0494	167.80	1231.40	1399.20
Furniture Upholsterer	1	.7333	.7333	.3954	579.80	11017.80	11597.60
Welder	0	.9090		.5440		6922.80	6922.80
Bricklayer	4	.8987	3.5948	.6867	4937.00	48136.60	53073.60
Carpenter	14	.7181	10.0534	.3741	7521.80	41370.60	48892.40
Meat Cutter	0	1.0000		.3922		1568.80	1568.80
Automobile Mechanic	2	.8205	1.6410	.5435	1783.60	19621.40	21405.00
Body Repairman	0	.5000		-.1666		- 1332.80	- 1332.80
Sewing Machine Repairman	0	.9000		.3000		540.00	540.00
Air-conditioning Mechanic	1	.5000	.5000	.5200	520.00	4680.00	5200.00
Sewing Machine Operator	2	.6476	1.2952	.4407	1141.40	29681.20	30822.60
Machine Tool Operator	2	.7750	1.5500	.5290	1639.80	20498.60	22138.40
Chassis Assembler	0	.8333		.5650		3766.40	3766.40
Presser	8	.6250	5.0000	.4360	4360.00		4360.00
Service Station Attendant	3	.9090	2.7270	.0900	490.80	3108.60	3599.40
	73	.7465	54.4945	.3352	36553.60	299833.20	336386.80

Probability of Employment = E as % of E, U, NILF
Probably Employed = Graduates II-Graduates I times Probability of Employment
Wage Difference = Wage differentials pre versus post training for 784 graduates
Other Benefits = Probably Employed times Wage Difference times 40 times 50
CNL Benefits = Wage Difference times CNL Employed times 40 times 50

Source: South Carolina Employemtn Security Commission

TABLE 6

LIFETIME BENEFITS FOR 30 WORKING YEARS BY SELECTED DISCOUNT AND PROMOTION RATES
ASSUMING AN INITIAL EARNINGS DIFFERENTIAL OF $525,650.00
AND ACCOUNTING FOR MORTALITY

Rate of Discount	Rate of Promotion							
	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5
5%	7,479,856	7,879,500	8,311,514	8,778,955	9,285,195	9,833,947	10,429,291	11,075,733
10%	4,711,824	4,899,446	5,099,735	5,313,757	5,542,677	5,787,773	6,050,439	6,332,203
15%	3,337,178	3,438,506	3,545,473	3,658,492	3,778,015	3,904,533	4,038,576	4,180,722
20%	2,556,110	2,617,372	2,681,451	2,748,527	2,818,794	2,892,462	2,969,755	3,050,917

Source: South Carolina Employment Security Commission

TABLE 7

LIFETIME BENEFITS FOR 30 WORKING YEARS BY SELECTED DISCOUNT AND PROMOTION RATES
ASSUMING AN INITIAL EARNINGS DIFFERENTIAL OF $719,629.00
AND ACCOUNTING FOR MORTALITY

Rate of Discount	Rate of Promotion							
	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5
5%	10,240,124	10,787,248	11,378,686	12,018,626	12,711,683	13,462,939	14,277,981	15,162,977
10%	6,450,614	6,707,474	6,981,675	7,274,676	7,588,074	7,923,618	8,283,214	8,668,956
15%	4,568,686	4,707,408	4,853,848	5,008,574	5,172,204	5,345,410	5,528,918	5,723,522
20%	3,499,384	3,583,252	3,670,978	3,762,808	3,859,005	3,959,859	4,065,675	4,176,787

Source: South Carolina Employment Security Commission

TABLE 8

SUMMARY OF COSTS A	(C_{is})	(C_{iser})	(C_{fc})	(C_{ucm})	(C_{ro})	(C_{ea})
Training	Instructional Supplies	Instructional Services	Fixed Charges	Utilities Custodian & Maintenance	Rent Opportunity Cost	Executive Administration Cost
Draftsman	1169	4640	188	760	1006	395
General Office Clerk	772	7840	3075	1393		790
Offset Duplicating Operator	14802	13198	2553	1997		790
Tabulating Machine Operator	2556	26362	2283	2250		395
Stenographer	4944	34389	5877	5511		1975
Sales Person	500	4758	369	750	443	395
Chambermaid	3970	19064	1634	2350	1131	2370
Cook	16960	28175	2895	3670	2206	1580
Waiter-Waitress	1080	7523	324	373	300	1185
Kitchen Helper	1237	6606	877	959	600	790
Nurse Aide	20328	77781	8208	8288	4851	7505
Janitor	1030	6687	1405	845		790
Farm Machine Operator	8500	34107	5831	3705	1986	3950
Landscape Gardener	2560	20904	1731	1240	3750	1580
Furniture Upholsterer	2480	10209	490	1547	143	790
Welder	10480	11362	419	1813	3086	790
Bricklayer	11775	57665	6911	4881	3000	4345
Carpenter	63945	109288	17412	14945	3342	6320
Meat Cutter	2918	10245	1368	820		395
Automobile Mechanic	13546	38291	8593	3812		1975
Automobile Body Repairman	3500	4292	1640	992		395
Sewing Machine Repairman	400	6479	498	539		395
Air-conditioning Mechanic	1711	4640	825	240		395
Sewing Machine Operator	9536	32863	2705	3126	2915	3160
General Machine Operator	26388	54048	6242	13008	1650	1580
Chassis Assembler	1440	4752	117	500	674	395
Presser	440	3266	687	278		395
Service Station Attendant	1920	12454	1905	1910	795	1185
	230887	651888	87062	82502	31878	47005
	15.08%	42.57%	5.68%	5.38%	2.08%	3.07%

Source: South Carolina Employment Security Commission

TABLE 8

ce	(C_{ro}) Rent Opportunity Cost	(C_{ea}) Executive Administration Cost	(C_{aa}) Allowance Administration Cost	(C_{spa}) Selection & Placement Administration Cost	(C_{ea}) Equipment Cost	Total without Allowances	(C_e) Allowances	Total with Allowances
	1006	395	619	1040	989	10806	5542	16348
		790	1238	2080	3487	20675	16500	37175
		790	2379	3120	8477	47316	26394	73710
		395	917	2080	5968	42811	7148	49959
		1975	4430	7280	12155	76561	73047	149608
	443	395	550	2080	706	10551	11580	22131
	1131	2370	1554	6240	1672	39985	48041	88026
	2206	1580	2476	4160	10383	72505	69991	142496
	300	1185	642	3120	974	15521	15069	30590
	600	790	596	2080	693	14438	18992	33430
	4851	7505	6851	22880	9919	166611	167230	333841
		790	556	2080	909	14302	16026	30328
	1986	3950	3730	11440	15351	88600	131533	220133
	3750	1580	1928	4160	1680	39533	58186	97719
	143	790	1212	2080	1745	20696	45932	66628
	3086	790	1145	2080	4635	35810	28293	64103
	3000	4345	5359	12480	7523	113939	140284	254223
	3342	6320	10461	17680	22066	265459	282608	548067
		395	573	1040	2496	19855	13716	33571
		1975	3026	5200	6548	80991	97483	178474
		395	642	1040	971	13472	22330	35802
		395	505	1040	985	10841	14648	25489
		395	606	1040	963	10420	16195	26615
	2915	3160	3423	11440	15152	84320	78129	162449
	1650	1580	5009	9360	54874	172159	124842	297001
	674	395	413	1040	356	9687	5967	15654
		395	278	1040	1261	7645	5246	12891
	795	1185	990	3120	1207	25486	25669	51155
	31878	47005	62108	143520	194145	1530995	1566621	3097616
	2.08%	3.07%	4.05%	9.37%	12.68%	100%		

TABLE 9

SUMMARY OF COSTS B

Training	(C_a) Administration	(C_p) Plant and Equipment	(C_i) Instruction	Total without Allowances	(C_e) Allowances	Total with Allowances
Draftsman	2054	2943	5809	10806	5542	16348
General Office Clerk	4108	7955	8612	20675	16500	37175
Offset Duplicating Operator	6289	13027	28000	47316	26394	73710
Tabulating Machine Operator	3392	10501	28918	42811	7148	49959
Stenographer	13685	23543	39333	76561	73047	149608
Sales Person	3025	2268	5258	10551	11580	22131
Chambermaid	10164	6787	23034	39985	48041	88026
Cook	8216	19154	45135	72505	69991	142496
Waiter-Waitress	4947	1971	8603	15521	15069	30590
Kitchen Helper	3466	3129	7843	14438	18992	33430
Nurse Aide	37236	31266	98109	166611	167230	333841
Janitor	3426	3159	7717	14302	16026	30328
Farm Machine Operator	19120	26873	42607	88600	131533	220133
Landscape Gardener	7668	8401	23464	39533	58186	97719
Furniture Upholsterer	4082	3925	12689	20696	45932	66628
Welder	4015	9953	21842	35810	28293	64103
Bricklayer	22184	22315	69440	113939	140284	254223
Carpenter	34461	57765	173233	265459	282608	548067
Meat Cutter	2008	4684	13163	19855	13716	33571
Automobile Mechanic	10201	18953	51837	80991	97483	178474
Automobile Body Repairman	2077	3603	7792	13472	22330	35802
Sewing Machine Repairman	1940	2022	6879	10841	14648	25489
Air-conditioning Mechanic	2041	2028	6351	10420	16195	26615
Sewing Machine Operator	18023	23898	42399	84320	78129	162449
General Machine Operator	15949	75774	80436	172159	124842	297001
Chassis Assembler	1848	1647	6192	9687	5967	15654
Presser	1713	2226	3706	7645	5246	12891
Service Station Attendant	5295	5817	14374	25486	25669	51155
	252633	395587	882775	1530995	1566621	3097616

Summary of Costs Tables 8 and 9 are equivalent. Table 9 has been condensed somewhat. Certain categories have been subsummed under others as follows:

Allowances = Allowances
Administration = Executive, Allowance, and Selection & Placement Administration Costs
Plant & Equipment = Fixed Charges; Utilities, Custodial, Maintenance; Rent Opportunity Cost; Equipment Cost
Instruction = Instructional Supplies; Instructional Services

Source: South Carolina Employment Security Commission

TABLE 10

INTERNAL RATE OF RETURN FOR AN INITIAL EARNINGS DIFFERENTIAL OF $525,650.00

Rate of Promotion	Internal Rate of Return
0	0.1629
0.5	0.1678
1.0	0.1727
1.5	0.1776
2.0	0.1826
2.5	0.1875
3.0	0.1924
3.5	0.1973

Source: South Carolina Employment Security Commission

TABLE 11

INTERNAL RATE OF RETURN FOR AN INITIAL EARNINGS DIFFERENTIAL OF $719,629.00

Rate of Promotion	Internal Rate of Return
0	0.2273
0.5	0.2323
1.0	0.2372
1.5	0.2422
2.0	0.2471
2.5	0.2520
3.0	0.2570
3.5	0.2620

Source: South Carolina Employment Security Commission

TABLE 12: Expected Lifetime Earnings of 188 Employed Nurses Aides Graduates I with an Initial Earnings Differential of $84,084.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	1,419,791	1,635,651	1,906,508	2,249,653
	10.0%	808,193	887,454	981,631	1,094,556
	15.0%	551,340	589,050	632,004	681,270
36 a.	5.0%	1,196,492	1,329,526	1,485,278	1,668,289
	10.0%	753,712	815,763	886,617	967,840
	15.0%	533,821	567,140	604,338	646,018
60 b.	5.0%	406,779	416,210	425,884	435,804
	10.0%	350,150 c	357,794	365,628	373,657
	15.0%	305,160	311,435	317,862	324,443

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $333,841.

SOURCE: South Carolina Employment Security Commission

TABLE 13: Expected Lifetime Earnings of 341 Graduates I Nurses Aides with an Initial Earnings Differential of $110,439.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	1,864,817	2,148,337	2,504,093	2,954,795
	10.0%	1,061,518	1,165,622	1,289,318	1,437,639
	15.0%	724,155	773,685	830,103	894,811
a.	5.0%	1,571,526	1,746,259	1,950,830	2,191,206
	10.0%	989,959	1,071,460	1,164,523	1,271,204
	15.0%	701,145	744,908	793,765	848,509
b.	5.0%	380,475	385,875	399,144	396,883
	10.0%	340,578 [c]	345,214	349,908	354,661
	15.0%	307,133	311,145	315,206	319,317

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $333,841.

SOURCE: South Carolina Employment Security Commission

TABLE 14: Expected Lifetime Earnings of 78 Employed Carpenters Graduates I with an Initial Earnings Differential of $58,359.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	985,424	1,135,245	1,323,237	1,561,401
	10.0%	560,937	615,949	681,313	759,691
	15.0%	382,664	408,838	438,651	472,844
39 a.	5.0%	786,185	866,197	958,478	1,065,203
	10.0%	508,934	548,436	593,083	643,698
	15.0%	365,114	387,082	411,451	438,564
28 b.	5.0%	924,948	1,049,138	1,200,191	1,385,107
	10.0%	548,360 c	598,889	657,955	727,455
	15.0%	378,990	404,172	432,647	465,025

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $548,067.

SOURCE: South Carolina Employment Security Commission

TABLE 15: Expected Lifetime Earnings of 187 Carpenters Graduates I with an Initial Earnings Differential of $91,089.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	1,538,075	1,771,918	2,065,341	2,437,074
	10.0%	875,525	961,389	1,063,411	1,185,744
	15.0%	597,273	638,125	684,657	738,028
a.	5.0%	1,227,098	1,351,983	1,496,017	1,662,595
	10.0%	794,357	856,013	925,699	1,004,700
	15.0%	569,879	604,167	642,203	684,521
b.	5.0%	697,635	728,518	761,165	795,679
	10.0%	550,695 c	572,558	595,599	619,886
	15.0%	447,509	463,441	480,181	497,775

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $548,067.

SOURCE: South Carolina Employment Security Commission

TABLE 16 **: Expected Lifetime Earnings of** 31 Employed **Graduates I** Automobile Mechanics **with an Initial Earnings Differential of** $33,697.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	568,987	655,493	764,041	901,557
	10.0%	323,886	355,651	393,392	438,647
	15.0%	220,951	236,064	253,278	273,022
32 a.	5.0%	509,041	571,073	646,504	736,239
	10.0%	310,435	337,660	369,135	405,714
	15.0%	216,852	230,891	246,675	264,505
57 b.	5.0%	223,209	231,258	239,666	238,449
	10.0%	182,078 c	188,084	194,347	200,876
	15.0%	151,789	156,369	161,136	166,096

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $178,474.

SOURCE: South Carolina Employment Security Commission

TABLE 17: Expected Lifetime Earnings of 61 Automobile Mechanics Graduates I with an Initial Earnings Differential of $47,448.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	801,183	922,992	1,075,836	1,269,472
	10.0%	456,061	500,787	553,931	617,654
	15.0%	311,119	332,399	356,638	384,438
32 a.	5.0%	716,774	805,008	910,335	1,036,689
	10.0%	437,120	475,455	519,775	571,280
	15.0%	305,347	325,115	347,341	372,446
60 b.	5.0%	229,944	234,866	240,325	245,923
	10.0%	197,588 c	201,902	206,323	210,853
	15.0%	172,201	175,742	179,368	183,082

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $178,474.

SOURCE: South Carolina Employment Security Commission

TABLE 18: Expected Lifetime Earnings of 70 Employed Bricklayers Graduates I with an Initial Earnings Differential of $96,138.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	1,623,328	1,870,132	2,179,819	2,572,156
	10.0%	924,053	1,014,677	1,122,354	1,251,468
	15.0%	630,378	673,495	722,606	778,935
32 a.	5.0%	1,452,301	1,631,078	1,844,487	2,100,501
	10.0%	885,676	963,349	1,053,149	1,157,507
	15.0%	618,683	658,736	703,769	754,636
62 b.	5.0%	331,204	335,905	340,666	345,488
	10.0%	296,474 c	300,509	304,596	308,733
	15.0%	267,360	270,852	274,388	277,966

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $254,223.

SOURCE: South Carolina Employment Security Commission

TABLE 19: Expected Lifetime Earnings of 118 Bricklayers Graduates I with an Initial Earnings Differential of $131,112.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	2,213,881	2,550,471	2,972,820	3,507,885
	10.0%	1,260,217	1,383,808	1,530,658	1,706,742
	15.0%	859,705	918,507	985,485	1,062,306
a.	5.0%	1,980,637	2,224,451	2,515,496	2,864,646
	10.0%	1,207,877	1,313,808	1,436,276	1,578,599
	15.0%	843,755	898,378	959,795	1,029,167
b.	5.0%	350,625	353,978	357,353	360,750
	10.0%	320,399 [c]	323,364	326,348	329,351
	15.0%	294,348	296,985	299,639	302,309

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $254,223.

SOURCE: South Carolina Employment Security Commission

TABLE 20: Expected Lifetime Earnings of 31 Employed Chambermaids Graduates I with an Initial Earnings Differential of $15,438.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	260,676	300,309	350,039	413,041
	10.0%	148,386	162,938	180,229	200,962
	15.0%	101,227	108,150	116,037	125,082
31 a.	5.0%	236,255	266,014	301,707	344,744
	10.0%	143,011	155,723	170,463	187,648
	15.0%	99,607	106,103	113,418	121,695
56 b.	5.0%	110,455	114,895	119,561	124,465
	10.0%	88,609 c	91,835	95,217	98,763
	15.0%	72,903	75,308	77,822	80,452

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $88,026.

SOURCE: South Carolina Employment Security Commission

TABLE 21: Expected Lifetime Earnings of 103 Chambermaids with an Initial Earnings Differential of $18,762.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	316,811	364,978	425,417	501,986
	10.0%	180,339	198,026	219,040	244,238
	15.0%	123,025	131,440	141,025	152,018
31 a.	5.0%	287,131	323,298	366,677	418,983
	10.0%	173,807	189,257	207,171	228,057
	15.0%	121,056	128,951	137,842	147,901
59 b.	5.0%	102,617	105,444	108,362	111,374
	10.0%	86,707 c	88,935	91,233	93,601
	15.0%	74,391	76,174	78,011	79,903

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $88,026.

SOURCE: South Carolina Employment Security Commission

TABLE 22 : **Expected Lifetime Earnings of** 26 Employed **Graduates I** Cooks **with an Initial Earnings Differential of** $14,138.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	238,739	275,036	320,581	378,281
	10.0%	135,898	149,226	165,062	184,050
	15.0%	92,708	99,049	106,272	114,556
42 a.	5.0%	178,579	195,000	213,650	234,873
	10.0%	119,120	127,729	137,351	148,131
	15.0%	86,780	91,760	97,243	103,295
* b.	5.0%				
	10.0%	c			
	15.0%				

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $142,496.
* - (Expected earnings are less than cost for all ages.)

SOURCE: South Carolina Employment Security Commission

TABLE 23: Expected Lifetime Earnings of 50 Cooks Graduates I with an Initial Earnings Differential of $15,118.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	255,282	294,094	342,795	404,493
	10.0%	145,315	159,566	176,499	196,804
	15.0%	99,132	105,912	113,636	122,494
42 a.	5.0%	190,954	208,513	228,454	251,148
	10.0%	127,374	136,580	146,869	158,396
	15.0%	92,793	98,118	103,982	110,453
27 b.	5.0%	242,145	275,305	315,823	365,673
	10.0%	142,632 c	155,915	171,482	189,852
	15.0%	98,355	104,925	112,363	120,833

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $142,496.

SOURCE: South Carolina Employment Security Commission

TABLE 24: Expected Lifetime Earnings of 91 Employed Farm Machine Operators Graduates I with an Initial Earnings Differential of $32,614.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	550,706	634,434	739,494	872,592
	10.0%	313,481	344,224	380,753	424,555
	15.0%	213,853	228,480	245,141	264,250
43 a.	5.0%	402,144	437,769	478,017	523,571
	10.0%	271,119	290,186	311,416	335,103
	15.0%	198,653	209,841	222,127	235,646
52 b.	5.0%	294,656	311,180	328,954	348,077
	10.0%	222,303 c	233,149	244,756	257,182
	15.0%	174,781	182,203	190,106	198,524

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $220,133.

SOURCE: South Carolina Employment Security Commission

TABLE 25 **:** **Expected Lifetime Earnings of** 191 **Graduates I** Farm Machine Operators **with an Initial Earnings Differential of** $51,926 **.**

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	876,791	1,010,095	1,177,362	1,389,271
	10.0%	499,099	548,047	606,205	675,942
	15.0%	340,479	363,767	390,294	420,718
43 a.	5.0%	640,262	696,980	761,061	833,588
	10.0%	431,653	462,011	495,812	533,524
	15.0%	316,280	334,093	353,653	375,178
59 b.	5.0%	283,997	291,823	299,899	308,233
	10.0%	239,966 c	246,134	252,492	259,046
	15.0%	205,881	210,817	215,901	221,136

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $220,133 .

SOURCE: South Carolina Employment Security Commission

TABLE 26: Expected Lifetime Earnings of 31 Employed General Machine Operators with an Initial Graduates I Earnings Differential of $32,798.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	553,807	638,005	743,657	877,505
	10.0%	315,246	346,162	382,897	426,945
	15.0%	215,057	229,766	246,521	265,738
30 a.	5.0%	508,133	573,569	652,422	747,986
	10.0%	305,384	332,878	364,845	402,233
	15.0%	212,116	226,043	241,749	259,552
34 b.	5.0%	481,693	538,165	604,930	684,204
	10.0%	298,394 c	323,798	352,993	386,694
	15.0%	209,793	223,150	238,117	254,958

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $297,00[illegible].

SOURCE: South Carolina Employment Security Commission

TABLE 27: Expected Lifetime Earnings of 65 General Machine Operators with an Initial Earnings Differential of $50,541.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	853,412	983,162	1,145,970	1,352,229
	10.0%	485,791	533,434	590,042	657,919
	15.0%	331,401	354,068	379,887	409,500
30 a.	5.0%	783,030	883,866	1,005,378	1,152,642
	10.0%	470,595	512,963	562,224	619,838
	15.0%	326,869	348,331	372,534	399,968
55 b.	5.0%	387,088	404,224	422,338	441,488
	10.0%	305,557 c	317,688	330,473	343,948
	15.0%	248,304	257,144	266,432	276,194

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $32,798.

SOURCE: South Carolina Employment Security Commission

TABLE 28 **: Expected Lifetime Earnings of** 17 Employed **Graduates I** Landscape Gardeners **with an Initial Earnings Differential of** $1,679.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	28,360	32,672	38,083	44,937
	10.0%	16,143	17,727	19,608	21,864
	15.0%	11,013	11,766	12,624	13,608
43 a.	5.0%	20,709	22,544	24,617	26,963
	10.0%	13,962	14,944	16,037	17,257
	15.0%	10,230	10,806	11,439	12,135
* b.	5.0%				
	10.0%	c			
	15.0%				

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $97,719.
* - (Expected earnings are less than cost for all ages.)

SOURCE: South Carolina Employment Security Commission

TABLE 29: Expected Lifetime Earnings of 52 Landscape Gardeners Graduates I with an Initial Earnings Differential of $2,291.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	38,693	44,576	51,958	61,310
	10.0%	22,025	24,185	26,752	29,830
	15.0%	15,025	16,053	17,224	18,566
43 a.	5.0%	28,255	30,758	33,586	36,787
	10.0%	19,049	20,389	21,880	23,544
	15.0%	13,957	14,743	15,607	16,557
* b.	5.0%				
	10.0%	c			
	15.0%				

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $97,719.
* - (Expected earnings are less than cost for all ages.)

SOURCE: South Carolina Employment Security Commission

TABLE 30 : **Expected Lifetime Earnings of** 61 Employed **Graduates I** Sewing Machine Operators **with an Initial Earnings Differential of** $53,765 .

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	907,849	1,045,876	1,219,069	1,438,484
	10.0%	516,779	567,460	627,679	699,886
	15.0%	352,540	376,653	404,119	435,621
35 a.	5.0%	777,614	866,444	970,957	1,094,404
	10.0%	485,693	526,376	572,982	626,597
	15.0%	342,695	364,306	388,480	415,625
62 b.	5.0%	185,227	187,855	190,518	193,215
	10.0%	165,803 c	168,060	170,346	172,660
	15.0%	149,522	151,475	153,452	155,453

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $162,449 .

SOURCE: South Carolina Employment Security Commission

TABLE 31 **:** **Expected Lifetime Earnings of** 157 **Graduates I** Sewing Machine Operators **with an Initial Earnings Differential of** $63,745 **.**

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	1,076,368	1,240,015	1,445,356	1,705,500
	10.0%	612,705	672,794	744,191	829,801
	15.0%	417,980	446,569	479,133	516,483
35 a.	5.0%	921,958	1,027,277	1,151,189	1,297,552
	10.0%	575,849	624,084	679,341	742,908
	15.0%	406,307	431,930	460,592	492,775
63 b.	5.0%	170,470	172,101	173,741	175,393
	10.0%	155,775 c	157,216	158,667	160,127
	15.0%	143,109	144,391	145,681	146,980

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $162,449 .

SOURCE: South Carolina Employment Security Commission

TABLE 32: Expected Lifetime Earnings of 36 Employed Graduates I Stenographers with an Initial Earnings Differential of $11,901.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	200,963	231,516	269,855	318,425
	10.0%	114,395	125,614	138,944	154,928
	15.0%	78,039	83,376	89,456	96,429
32 a.	5.0%	179,790	201,922	228,342	260,035
	10.0%	109,644	119,259	130,376	143,296
	15.0%	76,591	81,549	87,124	93,421
* b.	5.0%				
	10.0%	c			
	15.0%				

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $149,608.
* - (Expected earnings are less than cost for all ages.)

SOURCE: South Carolina Employment Security Commission

TABLE 33: Expected Lifetime Earnings of 62 Graduates I Stenographers with an Initial Earnings Differential of $13,306.

AGE	DISCOUNT RATE	RATE OF PROMOTION 0.0	1.0	2.0	3.0
21	5.0%	224,692	258,854	301,719	356,024
	10.0%	127,902	140,446	155,350	173,221
	15.0%	87,253	93,221	100,019	107,816
32 a.	5.0%	201,020	225,765	255,304	290,740
	10.0%	122,590	133,341	145,771	160,216
	15.0%	85,635	91,178	97,412	104,452
* b.	5.0%				
	10.0%	c			
	15.0%				

a. - Average Age of Training Group One Year After Training.
b. - Age at Which Expected Earnings Taken at a Discount Rate of 10% with No Promotion Approximately Equals Cost of Training.
c. - Cost of Training was $149,608.
* - (Expected earnings are less than cost for all ages.)

SOURCE: South Carolina Employment Security Commission